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Date: July 17, 1996

2730R

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Curtis R. Scharf et al.

Serial No: 08/599,423

Filed: January 16, 1996

For: LUBRICATING COMPOSITIONS

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INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Pursuant to 37 C.F.R. 1.97 and 1.98, and in compliance with 37 C.F.R. 1.56, the Examiner's attention is directed to the following items which may be relevant to examination of the present application. A copy of each listed document is enclosed and listed in numerical order on the attached PTO-1449. This paper is being filed prior to the mailing date of any Office Action issuing for this application. In the event that this paper is filed after the mailing date of a first Office Action, then Applicants petition the Commissioner to have the Information Disclosure Statement considered.

Fully formulated gear oils were sold more than one year before the filing of the present application. The formulations are described in Table I. The formulations contain less than about 10% by weight of a mineral oil having a kinematic viscosity of less than about 8 cSt at 100°C. The formulations contain functional additives.

Table I

	A	B	C	D	E	F
Polyisobutylene	23.8	--	34.6	24.7-25.3	24.7	--
4 cSt PAO	65.0	18.9-17.2	51.7	60.2-61.0	--	52.1
6 cSt PAO	--	--	--	--	37.1	--
100 cSt PAO	--	57.6-59.3	--	--	--	--
Carboxylic ester	--	13.5	--	--	23.4	--
Polymethacrylate viscosity improver	--	--	--	--	--	19.5
150 Bright Stock (kinematic viscosity 29.5 cSt at 100°C)	--	--	--	--	--	12.5

Table II describes concentrate formulations which were sold more than one year before the filing date of the present application. These concentrates contain less than about 15% by weight of a mineral oil having a kinematic viscosity of less than about 8 cSt at 100°C.

Table II

	A	B	C	D	E	F	G
Polyisobutylene	25.9	52.5	73.44	69.8	65.1	73.4	73.8
4 cSt PAO	70.7	--	8.2	--	--	--	--
6 cSt PAO	--	39.2	15	22	31.7	15	--
Alkylated benzene	--	--	--	--	--	--	14.5

The concentrate formulations are recommended for use in mineral or synthetic basestocks at a particular level. Table III describes the level of the concentrate additives at their recommended use levels.

Table III

	A	B	C	D	E	F	G
Polyisobutylene	9.1	18.4	25.7	24.43	22.8	25.7	21
4 cSt PAO	24.7	--	2.9	--	--	5.25	--
6 cSt PAO	--	13.7	5.2	7.7	11.1	--	--
Alkylated benzene	--	--	--	--	--	--	4.1

The following brief descriptions of the documents are based on the review of these documents by the undersigned. While these descriptions are believed to reflect the relevant content of the documents, it is not intended that the Patent and Trademark Office solely rely on the undersigned's descriptions. In reviewing the enclosed copies, the Examiner is requested to ignore any extraneous markings. The document copies being submitted with this "Information Disclosure Statement" are the best copies available at this time. The listing of any item herein is not intended as an admission that the item is legally qualified as "prior art".

**U.S. Documents:**

U.S. Patent 3,637,503, issued to Giannetti et al, relates to lubricant

compositions prepared by blending a mineral lubricating oil and a viscosity index improving amount of a polymer of a normal alpha olefin having from 4 to 16 carbon atoms per molecule. The polymer has a viscosity of about 40 to about 3000 centistokes at 210°F.

U.S. Patent 3,944,815, issued to Coleman, relates to additive concentrates comprising hydrogenated alkenyl-arene-conjugated diene interpolymers and a non-ester type synthetic lubricating diluent. The additive concentrate is blended with a lubricating oil which may include non-ester type synthetic lubricating oils, ester type synthetic lubricating oils, mineral lubricating oils, and mixtures thereof.

U.S. Patent 4,162,985, issued to Holubec, relates to multigrade lubricants. The lubricants include (A) about 95 to about 30% by weight of a base oil consisting of an oil having a viscosity of about 40 to about 200 SUS at 100°F, (B) an extreme pressure improving amount of at least one extreme pressure agent, and (C) from about 5 to about 70% by weight of at least one oil-soluble polymer. The polymer is a hydrogenated interpolymers of a monovinyl arene and at least one  $C_{4-6}$  conjugated diene or at least one  $C_{2-6}$  alpha olefin. Table II contains examples of lubricant compositions containing a base oil, polymer and extreme pressure agent.

U.S. Patent 4,299,714, issued to Sugiura et al, relates to hydrocarbon base central system fluids. The central system fluids comprise (1) 70 to 95% by weight of a hydrocarbon base oil and (2) 5 to 30% by weight of a viscosity index improver. The hydrocarbon base oil comprises (A) 25% to about 50% by weight of an oligomer of 1-decene having an average molecular weight of 200 to 600 and (B) more than 50% by weight to 75% by weight of a petroleum lubricating oil fraction. The viscosity index improver is a polymethacrylate having a viscosity average molecular weight of 10,000 to 700,000.

U.S. Patent 4,594,378, issued to Tipton et al; U.S. 4,654,403, issued to Tipton (which is a divisional of U.S. 4,594,378); and U.S. 4,734,446, issued to Tipton, (which is a divisional of U.S. 4,594,378), relates to polymeric compositions which comprise a mixture of (A) at least one oil soluble polymer which is a homopolymer of a non-aromatic monoolefin or a copolymer of said non-aromatic olefin with an aromatic mono olefin and (B-1) at least one nitrogen-containing ester of a carboxylic-containing interpolymer and/or (B-2) at least one oil-soluble acrylic polymerization product of an acrylic acid, or a mixture of one or more of (B-1) and (B-2). The composition may also include (C) a viscosity-reducing liquid organic diluent such as a naphthenic oil or an alkylated aromatic material. Examples A-C relate to polymeric compositions while Examples D-F relate to lubricant compositions containing polymeric compositions.

U.S. Patent 4,912,272, issued to Wu, relates to lubricant blends having high viscosity indices. The mixtures include blends of high viscosity index polyalphaolefins with mineral oil and/or other synthetic liquid lubricants.

U.S. Patent 4,956,122, issued to Watts et al, relates to lubricant compositions containing a high viscosity synthetic hydrocarbon, such as high viscosity polyalphaolefins; liquid hydrogenated polyisoprenes or ethylene-alphaolefin copolymers; a low viscosity mineral oil or synthetic hydrocarbon; and/or optionally a low viscosity ester, and an additive package to impart desirable performance properties.

U.S. Patent 4,968,853, issued to Scharf, relates to alpha-olefin polymers. In one embodiment the alpha-olefin polymers are liquid and have a polymodal distribution with peak molecular weight maximum at 2,000 to 5,000 and at 50,000 to 75,000. The alpha olefin polymer is blended with an oil of lubricating viscosity which include natural oils, synthetic oils, and mixtures thereof.

U.S. Patent 4,990,711, issued to Chen et al, relates to synthetic polyolefin lubricant blends. The mixtures include combinations of (A) a low viscosity  $C_{20}$ - $C_{60}$  lubricant range liquid comprising a substantially linear hydrocarbon having a kinematic viscosity of about 2-10 cS at 100°C and (B) at least one polyalphaolefin having viscosity greater than 20 cS at 100°C.

U.S. Patent 5,012,020, issued to Jackson et al, relates to the viscosity index enhancing compositions. The compositions involve mixtures of a branched  $C_{30}$ - $C_{10,000}$  hydrocarbon having a branch ratio of less than 0.19 and a viscosity of 100°C between 725 CS and 1500 CS together with mineral oil or synthetic lubricants to provide lubricant blends with elevated viscosity index. Table 2 has an example of a blend of a mineral oil and a viscosity index improver.

U.S. Patent 5,089,156, issued to Chrisope et al, and U.S. Patent 5,360,562, issued to Chrisope et al (which is a continuation of U.S. 5,089,152), relate to liquid compositions comprising a major amount of hydrogenated polyalphaolefin oligomer fluid having a viscosity in the range of about 2 to about 10 cSt at 100°C, and a minor amount of (A) a hydrogenated polyalphaolefin oligomer fluid having a viscosity in the range of about 40 to 120 cSt at 100°C and (B) antiwear/extreme pressure agent selected from phosphorus-containing ashless dispersant, boron-containing ashless dispersant, and phosphorus- and boron-containing ashless dispersants. A small amount of mineral oil, commercially available aromatic hydrocarbon mixtures, and/or oleaginous trihydrocarbyl phosphates may be included in the blends with 1 or more linear 1-alkene hydrocarbon oligomers of suitable viscosity.

U.S. Patent 5,105,038, issued to Chen et al, relates to synthetic polyolefin lubricant blends. The mixtures include combinations of (A) a low viscosity  $C_{20}$ - $C_{60}$  lubricant range liquid comprising a substantially linear hydrocarbon having a kinematic viscosity of about 2-10 cS at 100°C and (B) at least one polyalphaolefin having viscosity greater than 20 cS at 100°C.

U.S. Patent 5,146,021, issued to Jackson et al, relates to branched  $C_{30}$ - $C_{10,000}$  hydrocarbons which may be blended with mineral oil and synthetic lubricants.

U.S. Patent 5,151,205, issued to Culpon Jr., relates to chain and drive gear lubricants. The lubricating compositions include a polyalphaolefin base oil, an ester oil solubilizer and 2 to 4% by weight of a polybutene tackifier.

U.S. Patent 5,157,177, issued to Pelrine et al, relates to lube blends of branched  $C_{30}$ - $C_{10,000}$  hydrocarbons that have a branch ratio of less than 0.19 and a viscosity at 100°C between 725 cS and 15,000 cS together with mineral oil or synthetic lubricants.

U.S. Patent 5,180,865, issued to Heilman et al, relates to fully synthetic lubricating base oils comprising blends of 50-95% by weight of synthetic hydrocarbons and 3-50% by weight of isobutylene oligomers.

U.S. Patent 5,210,362, issued to Sowerby et al, relates to alphaolefin polymers. The polymers typically have a molecular weight from about 3,000 to about 100,000. The polymers may be combined with an oil of lubricating viscosity which includes natural oils, synthetic oils or mixtures thereof.

U.S. Patent 5,217,636, issued to Paboucek, relates to lubricants containing a mineral base oil to which is added a viscosity index improver and a wear enhancer package. The viscosity index improver is a mixture containing (A) 85 to 99.5% by weight of a low molecular weight ethylene-propylene copolymer and (B) 0.5 to 15% by weight of an esterified alkenyl vinyl polymer of pour point depressant to make 100% total of (A) and (B).

U.S. Patent 5,364,994, issued to Scharf, relates to lubricant compositions containing alphaolefin polymers. The lubricant compositions contain (A) a liquid alphaolefin polymer having a number average molecular weight from 2,000 to about 100,000 and derived from alphaolefins having from 4 to about 30 carbon atoms, provided that (A) has a bimodal molecular weight distribution having (i) a peak molecular weight maximum of 2,000 to 5,000 for a lower molecular weight component and (ii) a peak molecular weight maximum of 50,000 to 75,000 for a higher molecular weight component; (B) a oil of lubricating viscosity and (C) at least

one member selected from the group consisting of a friction modifier, a sulfurized olefin, an ash-producing detergent, and an ashless dispersant.

U.S. Patent 5,387,346, issued to Hartley et al, relates to automatic transmission fluids which comprise (A) from 50 to 85% by weight of a mineral oil having a viscosity of 100°C in the range of 3 to 5 centistokes, (B) from 5 to 35% by weight of a polyalphaolefin lubricating oil having a viscosity of 100°C in the range of 1 to 8 centistokes and (C) from 8 to 15% by weight of a combination of an alkenyl succinic dispersant, viscosity improver and antioxidant.

**Foreign Documents:**

CA 736,464, relates to lubricants which contact aluminum during cold rolling and other cold working processes. The lubricant is compounded with commercially available polybutene and a light mineral oil.

CA 1,043,322, relates to multigrade lubricants containing non-aromatic monoolefin polymers. The lubricants comprise (A) from about 95 to about 30 weight percent of a base oil, (B) at least one extreme pressure agent in an amount sufficient to improve the extreme pressure properties thereof, and (C) from about 5 to about 70 percent by weight of at least one oil-soluble polymer wherein the polymer is a homopolymer of a non-aromatic monoolefin having at least 3 carbon atoms and having a number average molecular weight of about 750 to about 10,000.

EP 578,435, relates to gear oils and gear oil additives which comprise (A) a base oil having at least 25% by weight of (i) a hydrogenated polyalphaolefin oligomer oil, or (ii) a synthetic ester oil, or combination thereof, (B) an amount of a gear oil additive package such that the gear oil lubricant satisfies or exceeds the specification for API GL4 service, and an amount in the range of 0.01 to 2% by weight of at least one alkali or alkaline earth metal salt of an oil soluble sulfonic acid.

WO 95/06700, relates to extreme pressure industrial gear lubricants which comprise a polyalphaolefin, a polyol ester, a polybutene oligomer, an antioxidant and an extreme pressure agent.



WO 95/06701, relates to automotive white oil-based lubricant compositions. The compositions comprise a white oil base stock and at least one polyisoalkylene compound. The polyisoalkylene compound, such as polyisobutenylene is alleged to act as an antioxidant.

Applicants respectfully request the Examiner to consider the above documents. If any fees are required by the filing of these papers, the Commissioner is authorized to charge those fees to Deposit Account No. 12-2275.

Respectfully Submitted,

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